

An Analysis on Potentially Dangerous Minor Incidents — Data from Instructors and Snorkelers —

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1. Background

In Japan, accidents of water activities with face mask and snorkel have been increased recently. From the data published by the Japan Coast Guard Agency, snorkeling accidents from 2008 to 2016 shows a fatality rate of 47 to 67% in regard to the number of all victims, which is significant higher level compared to the fatality rate of Scuba Diving accidents in Japan (Figure1) .

Reported main causes of accidents were; lack of knowledge and/or skills, including drowning or near drowning due to seawater inhalation from inability of snorkel clear, and own mistakes, such as carelessness on the activities or on weather and/or oceanic conditions.

In this study, issues that could lead to accidents were extracted from the questionnaires to snorkel instructors and snorkelers. These data should be a basis of establishing a measure of snorkeling accident prevention.

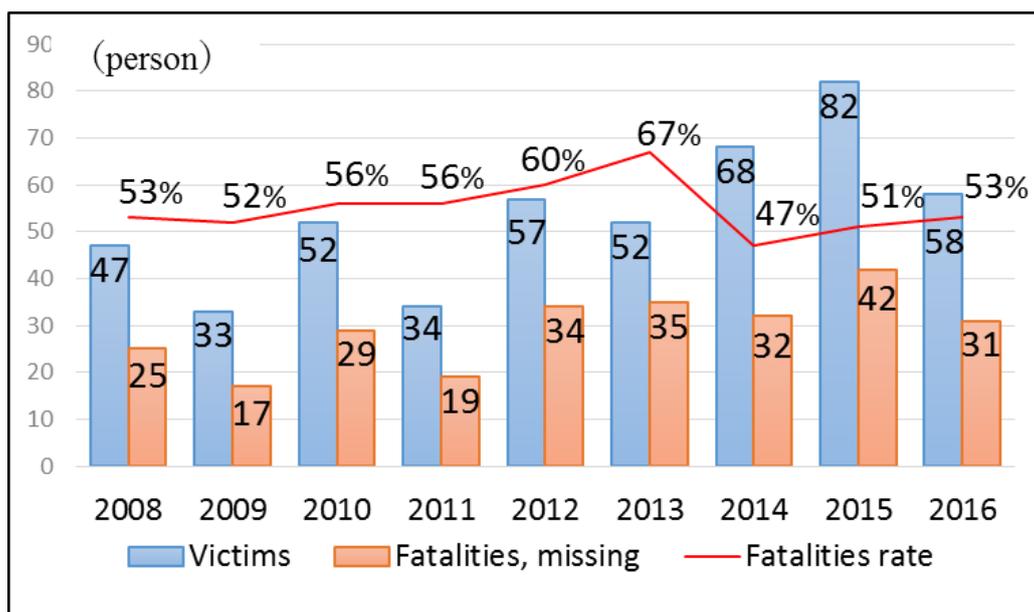


Fig.1 Snorkeling accidents (2008-2016)

2. Method

The Heinrich's Low, which shows the rate of "1:29:300" for describing the serious level of accidents, is widely known as a reference (Fig.2), while in this study, we focused on minor incidents which were hided themselves behind backgrounds and could lead to serious accidents.

This data was collected from the questionnaire on potentially dangerous minor incidents on snorkeling activities to the instructors attended to the 2017 official JASA (The Japan Amateur Sports Association) training session of Scuba Diving Instructors and the diving safety manager training session of Japan Marine Recreation Safety Association held from 2017 April 8 to 23, and the 163 persons of snorkelers of T University (2 to 4 grades) and the 117 of Snorkel Instructors. Collected data, 117 from snorkelers (71.8%) and 89 from instructors(6.1%), were analyzed.

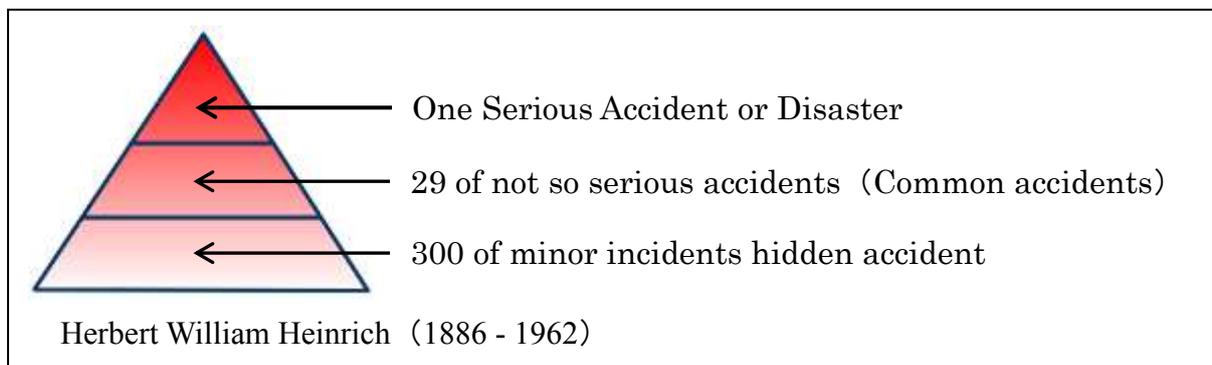


Fig.2 Heinrich's Low

3. Results

Snorkelers who experienced minor incidents were 41.9% (Fig.3). The activity situations when they realized these minor incidents were: in snorkeling tours with friends and/or families, 15.4%. the causes were; carelessness on the activities such as buddy lost were the most and 36.9%, followed by the lack of knowledge and skills including inability of snorkel clearing, which was 23.8%(Fig. 4). As of the snorkeling training courses, 56 subjects answered as "not attended any course", and this figure was the greatest. A cross analysis on the participation to snorkeling course (lecture or exercises) and the potentially dangerous minor incidents did not show any significant difference.

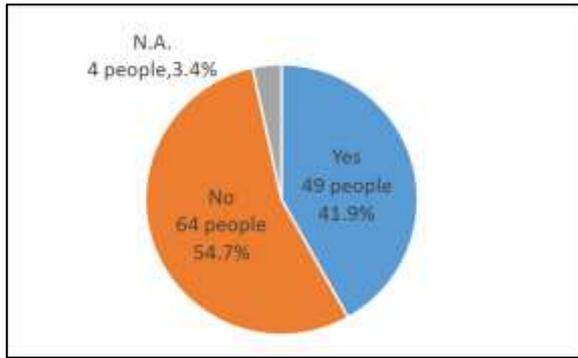


Fig.3 Experience of minor incidents

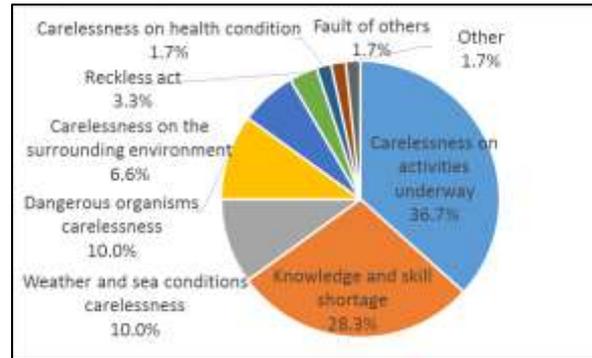


Fig.4 Causes of minor incidents (Snorkeler)
(Multiple answers are accepted)

Instructors and guides who experienced minor incidents were 43.8% (Fig. 5), and the situations were, in guiding activities, 55.8%; in training, 34.9%. The causes were 24% of carelessness on weather and ocean conditions, the most, and followed by the lack of knowledge and skills which was 26% (Fig.6). “A Prior correct instruction on knowledge and skills” for minimizing the minor incidents should be needed, was the most answer of 19 persons. The cross analysis between instruction experience and without experience did not show any statistical significance.

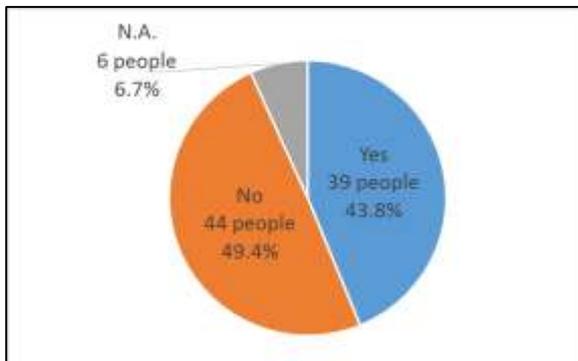


Fig.5 Experience of minor incidents
(Instructors)

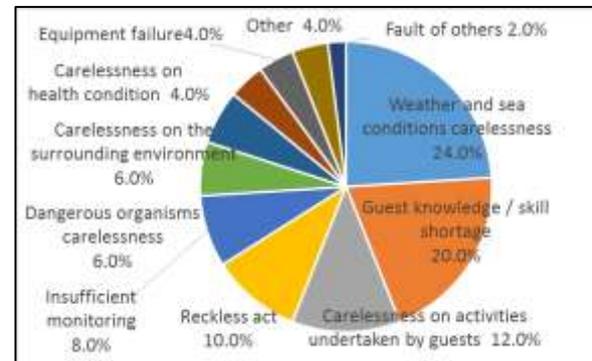


Fig.6 Causes of minor incidents (Instructor)
(Multiple answers are accepted)

According to the database of the Japan Coast Guard on Snorkeling Accidents, “Carelessness on the activity” was the most and 23.4%, followed by “lack of knowledge and skills” was 17.2%, and then “Carelessness on whether and ocean conditions” was 6.5%. These figures were coincident with that of the minor incidents of snorkelers. The two main causes of the minor incidents were “carelessness on whether and ocean conditions” and “Lack of knowledge and skills”.

4. Conclusion

In this study, the minor incidents which were common within snorkelers and instructors were; not knowing and/or incapable of how to clear the snorkel, leading to seawater inhalation (lack of knowledge and skills), buddy lost or near lost (carelessness on the activity).

Also, “The Report on marine accidents and its prevention 2016” (by the Japan CG) pointed out that there were many accidents caused by the lack of knowledge and skills, such as accidentally inhale seawater from the inability of snorkel clear (could not clear the water from the snorkel) or when the activities conducted without buddies (solo activity).

Thus, for reducing the potentially dangerous minor incidents, snorkelers should acquire the skills such as snorkel clear before participating the activity and adhere to the buddy procedure for never lost. Furthermore, they should work with multiple persons for addressing emergency situation, and should obtain the weather and ocean condition information prior to the activity. At last, when in the site, sea condition changes should be always monitored.

For instructors, they should train snorkelers to sufficiently perform the skills such as snorkel clear and buddy procedures, and teach the knowledge on weather and ocean conditions (Table 1).

Table 1 What are needed for the reduction of the accidents

Items	Snorkeler	Instructor
Snorkel Clear	Need to acquire	Train to acquire
Buddy lost	Stay with buddies	
	Avoid solo activity	Not allow solo activity
Whether and Ocean Cod.	Acquire Knowledge and Information	Provide Knowledge and Information

5.Key words: Snorkeling, Marine sports, Water activities, Minor Incident, Accident case

6. References

- 1) Japan Coast Guard (2008-2016): Marine accidents and its prevention, Accidents on Snorkeling activities.
- 2) Industrial accident prevention : a safety management approach, H.W. Heinrich, Dan Petersen, Nestor Roos ; [editors, Julienne V. Brown, Susan Hazlett] ,5th ed ,New York ; Tokyo : McGraw-Hill, c1980